Making Multimedia

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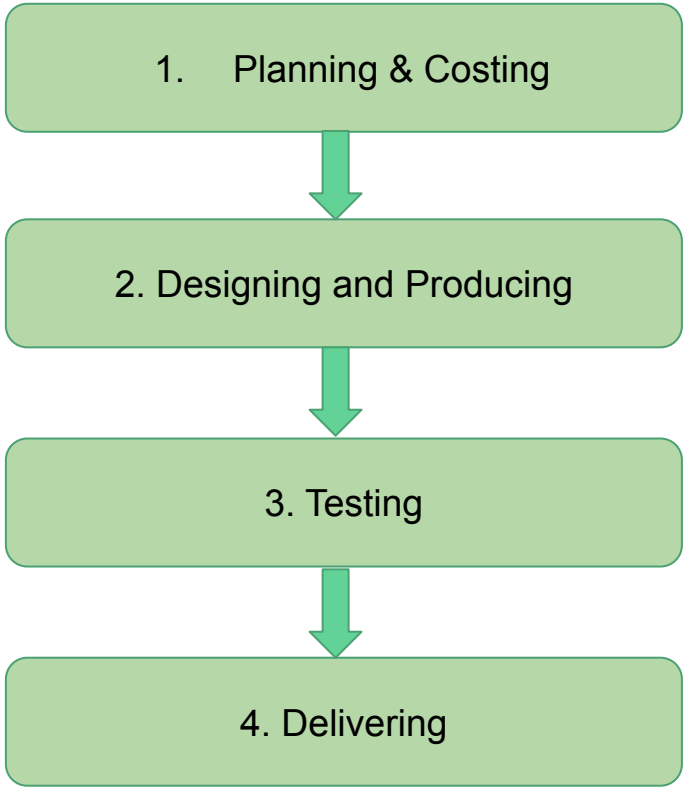
- A **multimedia project** is a classic software project which is developed using multimedia technology with the specific aim of distributing information in an entertaining and compelling manner.

- Multimedia projects require creativity, artistic as well as programming skills.

- While developing the multimedia application, the professionals have to choose the hardware and software equipment and components a variety of software tools are available.

Stages of a Multimedia Project



1. Planning & Costing

- A project always begins with an idea or a need that you then refine by outlining its messages and objectives.
- Identify how you will make each message and objective work within your authoring system.
- Before you begin developing, plan out the writing skills, graphic art, music, video, and other multimedia expertise that you will require.
- Develop a creative “look and feel” (what a user sees on a screen and how he or she interacts with it), as well as a structure and a navigational system that will allow the viewer to visit the messages and content.

- Estimate the time you'll need to do all the elements, and then prepare a budget. Work up a short prototype or proof-of-concept, a simple, working example to demonstrate whether or not your idea is feasible.
- The more time you spend getting a handle on your project by defining its content and structure in the beginning, the faster you can later build it, and the less reworking and rearranging will be required midstream.
- Your creative ideas and trials will grow into screens and buttons (or the look and feel), and your proof-of-concept will help you test whether your ideas will work.

2. Designing & Producing

- Perform each of the planned tasks to create a finished product.
- During this stage, there may be many feedback cycles with a client until the client is happy.
- Under this stage, the various sub-stages are to be carried out
  - Data Gathering
  - Navigation map structure design
  - Media content design
  - Interface Designing
  - Storyboarding
  - Integration (multimedia authoring)

3. Testing

- Testing the product ensures the product to be free from bugs
- Apart from bug elimination, another aspect of testing is to ensure that the multimedia application meets the objectives of the project.
- It is also necessary to test whether the multimedia project works properly on the intended delivery platforms, and they meet the needs of your client or end user.

Delivering

- The final stage is to pack the project and deliver the completed project to the end user.
- This stage has several steps such as implementation, maintenance, shipping and marketing the product.
- Be prepared to follow up over time with tweaks, repairs, and upgrades.

What You Need: The Intangibles

1. Creativity
2. Organization
3. Communication

1. Creativity

- Before beginning a multimedia project, you must first develop a sense of its scope and content.
- The most precious asset you can bring to the multimedia workshop is your creativity.
- You have a lot of room for creative risk taking, because the rules for what works and what doesn’t work are still being discovered.
- Taking inspiration from earlier experiments, developers modify and add their own creative touches for designing their own unique multimedia projects.
- It is very difficult to learn creativity, not impossible. Take risks.
- In the case of multimedia, being creative means you need to know your hardware and software first. Once you’re proficient with the hardware and software tools, you might ask yourself, “What can I build that will look great, sound great, and knock the socks off the viewer?”

2. Organization

- It’s essential that you develop an organized outline and a plan that rationally details the skills, time, budget, tools, and resources you will need for a project.
- These should be in place before you start to render graphics, sounds, and other components, and a protocol should be established for naming the files so you can organize them for quick retrieval when you need them.
- These files—called assets—should continue to be monitored throughout the project’s execution.

3. Communication

- Many multimedia applications are developed in workgroups comprising instructional designers, writers, graphic artists, programmers, and musicians located in the same office space or building.
- The workgroup members' computers are typically connected on a local area network (LAN). The client's computers, however, may be thousands of miles distant, requiring other methods for good communication.
- Communication among workgroup members and with the client is essential to the efficient and accurate completion of your project.
- If your client and you are both connected to the Internet, a combination of Skype video and voice telephone, e-mail, and the File Transfer Protocol (FTP) may be the most cost-effective and efficient solution for both creative development and project management.
- In the workplace, use quality equipment and software for your communications setup. The cost—in both time and money—of stable and fast networking will be returned to you.

What You Need: Hardware

- The two most significant platforms for producing and delivering multimedia projects: the Apple Macintosh operating system (OS) and the Microsoft Windows OS, found running on most Intel-based PCs
- Historically, multimedia was developed on specialized workstations from Silicon Graphics, Sun Microsystems, and even on mainframes
- But now, the Macintosh as well as the Windows PC offer a combination of affordability, and software and hardware availability and worldwide obtainability.
- Projects must be tested to ensure proper performance in all target environments.
- Selection of the proper platform for developing your multimedia project may be based on your personal preference of computer, your budget constraints, project delivery requirements, and the type of material and content in the project.

What You Need: Hardware

Windows vs Mac:

- The Microsoft OS can run on assemblages of hardware from countless manufacturers
- Apple OS runs on computers built by apple.

What You Need: Hardware

Networking MACs and Windows:

- Local area networks (LANs) and wide area networks (WANs) can connect the members of a workgroup.
- In a **LAN**, workstations are usually located within a short distance of one another, on the same floor of a building, for example.
- LANs allow direct communication and sharing of peripheral resources such as file servers, printers, scanners, and network routers. They use a variety of proprietary technologies to perform the connections, most commonly Ethernet (using twisted-pair copper wires) and WiFi (using radio).
- Client/Server software allows computer to communicate

What You Need: Hardware

- **WAN**s are communication systems spanning greater distances, typically set up and managed by large corporations and institutions for their own use, or to share with other users.
- Used by large corporation
- Expensive to install and maintain
- Internet Service Providers (ISPs) connect computers to the internet via a WAN

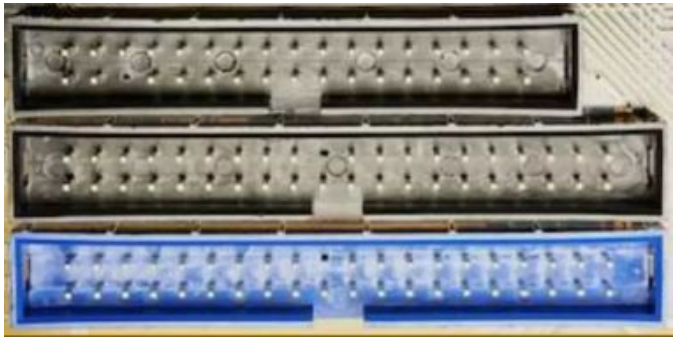
What You Need: Hardware

- The equipment required for developing your multimedia project will depend on the content of the project as well as its design.

Connections:

- Integrated Drive Electronics (IDE)
- Universal Serial Bus (USB)
- FireWire (IEEE 1394)
- Small Computer System Interface (SCSI)

What You Need: Hardware



IDE (Integrated Drive Electronics)

- Integrated Drive Electronics (IDE) connections, also known as Advanced Technology Attachment (ATA) connections
- typically only internal, and they connect hard disks, CD-ROM drives, and other peripherals mounted inside the PC.
- With IDE controllers, you can install a combination of hard disks, CD-ROM drives, or other devices in your PC.
- The circuitry for IDE is typically much less expensive than for SCSI, but comes with some limitations. For example, IDE requires time from the main processor chip, so only one drive in a master/slave pair can be active at once.

What You Need: Hardware

USB (Universal Serial Bus):

- These devices are automatically recognized (“plug-and-play”) and installed without users needing to install special cards or turn the computer off and on when making the connection.
- USB uses a single cable to connect as many as 127 USB peripherals to a single personal computer.
- USB connections are now common on video game consoles, cameras, GPS locators, cell phones, televisions, MP3 players, PDAs, and portable memory devices.

What You Need: Hardware

FireWire and i.LINK (IEEE 1394):

- FireWire was introduced by Apple in the late 1980s
- in 1995 it became an industry standard (IEEE 1394) supporting high-bandwidth serial data transfer, particularly for digital video and mass storage.
- Like USB, the standard supports hot-swapping and plug-and-play, but it is faster, and while USB devices can only be attached to one computer at a time, FireWire can connect multiple computers and peripheral devices (peer-to-peer).
- Both the Mac OS and Windows offer IEEE 1394 support.
- Sony calls this standard i.LINK.
- FireWire has replaced Parallel SCSI in many applications because it’s cheaper and because it has a simpler, adaptive cabling system.

What You Need: Hardware

Small Computer System Interface (SCSI):

- connect internal devices such as hard drives that are inside the chassis (body) of your computer and use the computer's power supply, and external devices, which are outside the chassis, use their own power supply, and are plugged into the computer by cable.
- The hardware and the drivers for SCSI have improved over the years to provide faster data transfers across wider buses.
- Unlike the less expensive IDE scheme, a SCSI controller does not demand CPU time, and because it can support many devices it is often preferred for real-time video editing, network servers, and situations in which writing simultaneously to two or more disks (mirroring) is required.

What You Need: Hardware

Memory and Storage Devices

- To estimate the memory requirements of a multimedia project—the space required on a hard disk, thumb drive, CD-ROM, or DVD
- Depending on the projects content and scope Random Access Memory (RAM) used while your computer is running enables simultaneous use of many applications.
- Color images, text, sound bites, video clips, and the programming code that glues it all together require memory
- If you are making multimedia, you will also need to allocate memory for storing and archiving working files used during production, original audio and video clips, edited pieces, and final mixed pieces, production paperwork and correspondence, and at least one backup of your project files, with a second backup stored at another location.

What You Need: Hardware

Memory and Storage Devices

- Read-Only Memory (ROM) is not volatile. When you turn off the power to a ROM chip, it will not forget, or lose its memory
- ROM is typically used in computers to hold the small BIOS program that initially boots up the computer, and it is used in printers to hold built-in fonts.
- Programmable ROMs (called EPROMs) allow changes to be made that are not forgotten when power is turned off.
- Random Access Memory (RAM) enables the simultaneous running of many applications.

What You Need: Hardware

Memory and Storage Devices

- Hard Disks - non-removable mass-storage devices and have a high data storage capacity and data transfer speed.
  - hard disks are often configured into fail-proof redundant arrays offering built-in protection against crashes.
- Flash Drives (USBs) - These flash memory data storage devices are about the size of a thin cigarette lighter and can be integrated with USB or FireWire interfaces to store from eight megabytes to several GB of data. They are available in every color of the rainbow, are extremely portable, and, because they have fewer moving parts, are more reliable than disk drives.

  -This same solid-state storage is used in digital cameras, cell phones, and audio recording devices, and for solid-state hard drives (no spinning platters or moving parts) that are found in some netbooks and other handheld devices.

What You Need: Hardware

Memory and Storage Devices

- CD-ROM - good for finished multimedia projects, A wide variety of developer utilities, graphic backgrounds, stock photography and sounds, applications, games, reference texts, and educational software are available on this medium.
- With a compact disc recorder, you can make your own CDs, using CD-recordable (CD-R) blank discs to create a CD in most formats of CD-ROM and CD-Audio
- CD-R discs are manufactured differently than normal CDs but can play in any CD-Audio or CD-ROM player. These write-once, enhanced CDs make excellent high-capacity file archives and are used extensively by multimedia developers for pre-mastering and testing CD-ROM projects and titles. Because they have become very inexpensive, they are also used for short-run distribution of finished multimedia projects and data backup.
- CD-RW - can be completely erased
- CD-RW Recorder can rewrite 700 mb of data 1000 times

What You Need: Hardware

Memory and Storage Devices

- DVD - optical disc technology used to distribute multimedia projects and feature-length movies

  -With a DVD capable not only of gigabyte storage capacity but also full-motion video (MPEG2) and high-quality audio in surround sound, this is an excellent medium for delivery of multimedia projects.

  -There are three types of DVD, including DVD-Read Write, DVD-Video, and DVD-ROM. These types reflect marketing channels, not the technology.

- Blue-Ray - used for high def television, mass storage

  -Blu-ray is promoted not only for high definition television recording and high definition video distribution, but also for high definition camcorder archiving, mass data storage, and digital asset management and professional storage when used as a recording medium in BD-R forma

What You Need: Hardware

Input Devices

- Keyboards, Mouse
- Optical Character Recognition(OCR) - you can convert paper documents into a word processing document on your computer without retyping
- Quick Response (QR) codes
- Voice Recognition Systems - automatically filter out background noise & learns to recognise voice prints
- Microphone & Cables
- Digital Cameras
- Scanners

What You Need: Hardware

Input Devices

- A great variety of input devices—from the familiar keyboard and handy mouse to touchscreens and voice recognition setups—can be used for the development and delivery of a multimedia project.
- If you are designing your project for a public kiosk, use a touchscreen. If your project is for a lecturing professor who likes to wander about the classroom, use a remote handheld mouse.
- Barcode readers are probably the most familiar optical character recognition devices in use today—mostly at markets, shops, and other pointof-purchase locations. Using photo cells and laser beams, barcode readers recognize the numeric characters of the Universal Product Code (UPC) that are printed in a pattern of parallel black bars on merchandise labels. With OCR, or barcoding, retailers can efficiently process goods in and out of their stores and maintain better inventory control

What You Need: Hardware

Output Devices

-presentation of audio and video components of your project

- Speakers
- Amplifiers
- Projectors
- Color Printers

What You Need: Hardware

- Often the speakers you use during a project's development will not be adequate for its presentation. Speakers with built-in amplifiers or attached to an external amplifier are important when your project will be presented to a large audience or in a noisy setting.
- The monitor you need for development of multimedia projects depends on the type of multimedia application you are creating, as well as what computer you're using.
- When you need to show your material to more viewers than can huddle around a computer monitor, you will need to project it onto a large screen or even a white-painted wall. Cathode-ray tube (CRT) projectors, liquid crystal display (LCD) panels, Digital Light Processing (DLP) projectors, and liquid crystal on silicon (LCOS) projectors, as well as (for larger projects) Grating-Light-Valve (GLV) technologies, are available.

What You Need: Hardware

- Graphic print designers often use special color-correction hardware to ensure that what they see on screen matches precisely what will be printed.
- Hard-copy printed output also plays a big role in multimedia scene. From storyboards to presentations to production of collateral marketing material, printouts are an important part of the multimedia development environment.

What You Need: Software

Text Editing and Word Processing Tools

- A **word processor** is usually the first software tool computer users learn. From letters, invoices, and storyboards to project content, your word processor may also be your most often used tool, as you design and build a multimedia project.
- When a group of people who work together in an office need to create documents, they will usually choose one specific program to use. This program is called a "word processor" and it allows people to type, format, and save their documents in a certain way that everyone can use. Usually, this word processor is part of a larger set of programs called an "office suite". This suite might include other programs like spreadsheets, databases, email, web browsers, and presentation tools. By using the same office suite, everyone in the group can work on the same types of files and share them easily.

What You Need: Software

Text Editing and Word Processing Tools

- Word processors like Microsoft Word and WordPerfect are computer programs that help you create and edit documents, such as letters or resumes. They have helpful tools like spell checkers, table formatting, and thesauruses to make your work easier. OpenOffice is another program like Microsoft Word, but it's free to download and use. It can do many things like word processing, spreadsheets, presentations, graphics, and databases. OpenOffice can even read and write files from other office programs that cost money. It's available in many different languages.

What You Need: Software

ORC Software

- OCR software turns bitmapped characters into electronically recognizable ASCII text.
- A scanner is typically used to create the bitmap.
- Then the software breaks the bitmap into chunks according to whether it contains text or graphics, by examining the texture and density of areas of the bitmap and by detecting edges.
- The text areas of the image are then converted to ASCII characters using probability and expert system algorithms
- Accurate and saves time

What You Need: Software

Painting and Drawing Tools

- **Painting software** like Photoshop, Fireworks, and Painter is used to create pictures made up of tiny dots called pixels. These are great for creating detailed images like photos or digital paintings.
- **Drawing software** like CorelDraw, FreeHand, Illustrator, Designer, and Canvas is used to create images made of lines and shapes that can be resized without losing quality. This is good for creating logos, diagrams, and other things that need to be printed at high quality.
- Some programs can do both drawing and painting, but some programs can only work with pixel-based images. When you're working on a project, it's important to use the right type of software to get the results you want.

What You Need: Software

features in a drawing or painting package:

- An intuitive graphical user interface with pull-down menus, status bars, palette control, and dialog boxes for quick, logical selection
- Scalable dimensions, so that you can resize, stretch, and distort both large and small bitmaps
- Paint tools to create geometric shapes, from squares to circles and from curves to complex polygons
- The ability to pour a color, pattern, or gradient into any area
- The ability to paint with patterns and clip art
- Customizable pen and brush shapes and sizes
- An eyedropper tool that samples colors

What You Need: Software

features in a drawing or painting package:

- An autotrace tool that turns bitmap shapes into vector-based outlines
- Support for scalable text fonts and drop shadows
- Multiple undo capabilities, to let you try again
- A history function for redoing effects, drawings, and text
- A property inspector
- A screen capture facility
- Painting features such as smoothing coarse-edged objects into the background with anti-aliasing; airbrushing in variable sizes, shapes, densities, and patterns; washing colors in gradients; blending; and masking.

What You Need: Software

features in a drawing or painting package:

- Support for third-party special-effect plug-ins
- Object and layering capabilities that allow you to treat separate elements independently
- Zooming, for magnified pixel editing
- All common color depths: 1-, 4-, 8-, and 16-, 24-, or 32-bit color, and gray-scale
- Good color management and dithering capability among color depths using various color models such as RGB, HSB, and CMYK
- Good palette management when in 8-bit mode
- Good file importing and exporting capability for image formats such as PIC, GIF, TGA, TIF, PNG, WMF, JPG, PCX, EPS, PTN, and BMP

What You Need: Software

3D Modeling & Animation Tools:

- 3D modeling software is a computer program that helps you create three-dimensional objects that look realistic. These objects can be used to create scenes that you can move through and view from different angles.
- The software has tools that allow you to choose the lighting and perspective for your final image. There are many powerful 3D modeling packages like VectorWorks, AutoDesk's Maya, Strata 3D, and Avid's SoftImage that come with pre-made 3D objects like people, furniture, buildings, and trees.
- Blender is a powerful and free 3D modeling program with many features.
- Google SketchUp is a free 3D modeling program that has fewer features but has a large online library of objects.
- These 3D modeling programs are important for multimedia development because they allow you to create and save animations of moving through a scene as a video file, such as a QuickTime or MPEG file.

What You Need: Software

3D Modeling software features include:

- Multiple windows that allow you to view your model in each dimension, from the camera's perspective, and in a rendered preview
- The ability to drag and drop primitive shapes into a scene
- The ability to create and sculpt organic objects from scratch
- Lathe and extrude features
- Color and texture mapping
- The ability to add realistic effects such as transparency, shadowing, and fog
- The ability to add spot, local, and global lights, to place them anywhere, and manipulate them for special lighting effects
- Unlimited cameras with focal length control
- The ability to draw spline-based paths for animation

What You Need: Software

Image Editing Tools:

- Image-editing applications are computer programs that help you edit and enhance existing bitmapped images. These programs can be used to retouch photos or create new images from scratch using tools similar to those found in painting and drawing programs.
- You can use image-editing applications to create images from sources like scanners, video frame-grabbers, digital cameras, and clip art files. You can also use them to modify original artwork files created with a painting or drawing program.
- Image-editing applications are very powerful and specialized tools that can help you create stunning images by enhancing and retouching existing images or creating new ones from scratch.

What You Need: Software

Features of Image Editing Tools:

- Multiple windows that provide views of more than one image at a time
- Conversion of major image-data types and industry-standard file formats
- Direct inputs of images from scanner and video sources
- Employment of a virtual memory scheme that uses hard disk space as RAM for images that require large amounts of memory
- Capable selection tools, such as rectangles, lassos, and magic wands, for selecting portions of a bitmap
- Image and balance controls for brightness, contrast, and color balance
- Good masking features

What You Need: Software

- Multiple undo and restore features
- Anti-aliasing capability, and sharpening and smoothing controls
- Color-mapping controls for precise adjustment of color balance
- Tools for retouching, blurring, sharpening, lightening, darkening, smudging, and tinting
- Geometric transformations such as flip, skew, rotate, and distort, and perspective changes
- The ability to resample and resize an image
- 24-bit color, 8- or 4-bit indexed color, 8-bit gray-scale, black-and-white, and customizable color palettes
- The ability to create images from scratch, using line, rectangle, square, circle, ellipse, polygon, airbrush, paintbrush, pencil, and eraser tools, with customizable brush shapes and user-definable bucket and gradient fills

What You Need: Software

- Multiple typefaces, styles, and sizes, and type manipulation and masking routines
- Filters for special effects, such as crystallize, dry brush, emboss, facet, fresco, graphic pen, mosaic, pixelize, poster, ripple, smooth, splatter, stucco, twirl, watercolor, wave, and wind
- Support for third-party special-effect plug-ins
- The ability to design in layers that can be combined, hidden, and reordered

What You Need: Software

Sound Editing Tools:

- Sound-editing tools are computer programs that help you edit music and sounds. They allow you to both see and hear the music.
- You can create a picture of the sound by drawing lines, i.e. by drawing a representation of a sound in fine increments, whether a score or a waveform which represent the different parts of the sound.
- This allows you to cut, copy, paste, and edit small parts of the sound very accurately. You can do this with much more precision than you could in real time.

What You Need: Software

Animation, Video, & Digital Movie Tools:

- Animations and digital video movies are made up of a sequences of bitmapped graphics scenes (called frames) that are played back quickly to make it look like there's movement.
- But animations can also be made within the authoring system by rapidly changing the location of objects, or sprites, to generate an appearance of motion.
- There are two main ways to create animations using these programs: either by making individual frames or by manipulating objects. Most animation programs use one of these methods, but not usually both.
- Moviemaking tools such as Premiere, Final Cut Pro, VideoShop, and MediaStudio Pro let you edit and assemble video clips captured from camera, tape, other digitized movie segments, animations, scanned images, and from digitized audio or MIDI files.

What You Need: Software

Helpful Accessories:

- A **screen-grabber** is an important tool on both Mac and Windows computers. This tool allows you to take a picture of all or part of what's on your computer screen, which is called a bitmapped image. You can then import this image into other programs or edit it in an image-editing application.
- With a screen-grabber, you can copy part or all of the screen display into the clipboard, which is like a temporary storage area in your computer's memory. This makes it easy to move the picture from one program to another without having to save it as a file first.
- To do a screen-grab on Windows, press the "print screen" key. On a Macintosh, press the command, control, shift, and number 4 keys at the same time, and then drag a rectangle across the screen. Whatever is in the rectangle will be placed on the clipboard, ready for pasting into an image editing program.
- In Mac OS X, you can also use a tool called "Grab" to capture the screen.

What You Need: Software

Helpful Accessories:

- Format converters are important tools for projects where you may need to use different types of computers, like Macs, PCs, Unix workstations, or even big mainframe computers. This is especially important when working with video and audio files because there are many different formats and ways of compressing the files.
- A format converter is a tool that can change the file format of your source material so that it can be used on different types of computers or with different software programs. For example, if you have a video file that was made on a Mac and you need to use it on a PC, a format converter can change the file format so that it can be read and used on the PC.
- Without format converters, you might not be able to use your source material with certain programs or on certain computers. So, they are really important tools to have when working on multimedia projects.

What You Need: Authoring Tools

- Authoring tools provide the important framework you need for organizing and editing the elements of your multimedia project, including graphics, sounds, animations, and video clips.
- Authoring tools are used for designing interactivity and the user interface, for presenting your project on screen, and for assembling diverse multimedia elements into a single, cohesive product.
- Authoring software provides a integrated environment that brings together all the different parts of your project into one place. It includes everything you need to create, edit, and bring in different types of data.
- With authoring software, you can put all the pieces of your project together in a certain order to create a playback sequence or cue sheet. This helps you make sure everything plays in the right order and at the right time.
- Authoring software also provides a way for your project to respond to user input. This means that if someone interacts with your project, like by clicking a button, the software knows what to do next. So, in short, authoring software is a tool that helps you create multimedia projects by providing everything you need to create, edit, and put all the pieces together in a specific order. It also provides a way for your project to respond to user input.

What You Need: Authoring Tools

With multimedia authoring software, you can make:

- Video productions
- Animations
- Games
- Interactive web sites
- Demo disks and guided tours
- Presentations
- Kiosk applications
- Interactive training
- Simulations, prototypes, and technical visualizations

What You Need: Authoring Tools

Helpful ways to get started:

- Use templates that people have already created to set up your production. These can include appropriate styles for all sorts of data, font sets, color arrangements, and particular page setups that will save you time.
- Use wizards when they are available—they may save you much time and pre-setup work.
- Use named styles, because if you take the time to create your own it will really slow you down. Unless your client specifically requests a particular style, you will save a great deal of time using something already created, usable, and legal
- Improve document appearance with bulleted and numbered lists and symbols.
- Create tables, which you can build with a few keystrokes in many programs, and it makes the production look credible

What You Need: Authoring Tools

Helpful ways to get started:

- Help readers find information with tables of contents, running headers and footers, and indexes.
- Improve document appearance with bulleted and numbered lists and symbols.
- Allow for a quick-change replacement using the global change feature.
- Reduce grammatical errors by using the grammar and spell checker provided with the software. Do not rely on that feature, though, to set all things right—you still need to proofread everything.
- Include identifying information in the filename so you can find the file later.

What You Need: Authoring Tools

TYPES OF AUTHORING TOOLS:

The various multimedia authoring tools can be categorized into three groups, based on the method used for sequencing or organizing multimedia elements and events:

1. Card- or page-based tools
2. Icon-based, event-driven multimedia and game-authoring tools
3. Time-based tools

What You Need: Authoring Tools

1. **Card based Authoring Tools**

- In these authoring systems, elements are organized as pages of a book or a stack of cards.
- In the book or stack there are thousand of pages or cards available.
- These tools are best used when the bulk of your content consists of elements that can be viewed individually letting the authoring system link these pages or cards into organized sequences, for example the pages of a book or file cards in card file.
- You can jump from page to page because all the pages are interrelated.
- You can organize pages/cards in the sequence manner.
- Every page of the book may contain media elements like sounds, videos, animations.
- Examples: PowerPoint, Tool Book, HyperCard(Mac), SuperCard(Mac)

- Page-based authoring systems such as LiveCode from Runtime Revolution (www.runrev.com) and ToolBook (www.toolbook.org) contain media objects: buttons, text fields, graphic objects, backgrounds, pages or cards, and even the project itself.
- The characteristics of objects are defined by properties (highlighted, bold, red, hidden, active, locked, and so on).
- Each object may contain a programming script, usually a property of that object, activated when an event (such as a mouse click) related to that object occurs.
- Events cause messages to pass along the hierarchy of objects in the project; for example, a mouse-clicked message could be sent from a button to the background, to the page, and then to the project itself.
- As the message traveled, it looks for handlers in the script of each object; if it finds a matching handler, the authoring system then executes the task specified by that handler.

What You Need: Authoring Tools

Advantages:

- Easy to understand
- Easy to use as these tools provide template
- Short development time
- One screen is equal to 1 card/Page

Disadvantages:

- Some only run on 1 platform

What You Need: Authoring Tools

2. Icon Based/ Event Driving Authoring Tools

- Icon- or object-based, event-driven tools are authoring systems, wherein multimedia elements and interaction cues (events) are organized as objects in a structural framework or process.
- simplify the organization of your project and typically display flow diagrams of activities along branching paths.
- In complicated navigational structures, this charting is particularly useful during development.
- Icon-based, event-driven tools provide a visual programming approach to organizing and presenting multimedia.

- First you build a structure or flowchart of events, tasks, and decisions, by dragging appropriate icons from a library.
- These icons can include menu choices, graphic images, sounds, and computations.
- The flowchart graphically depicts the project's logic. When the structure is built, you can add your content: text, graphics, animation, sounds, and video movies.
- Then, to refine your project, you edit your logical structure by rearranging and fine-tuning the icons and their properties.
- With icon-based authoring tools, non-technical multimedia authors can build sophisticated applications without scripting
- These tools are useful for storyboarding, as you can change sequences, add options, and restructure interactions by simply dragging and dropping icons.
- You can print out your navigation map or flowchart, an annotated project index with or without associated icons, design and presentation windows, and a cross-reference table of variables.

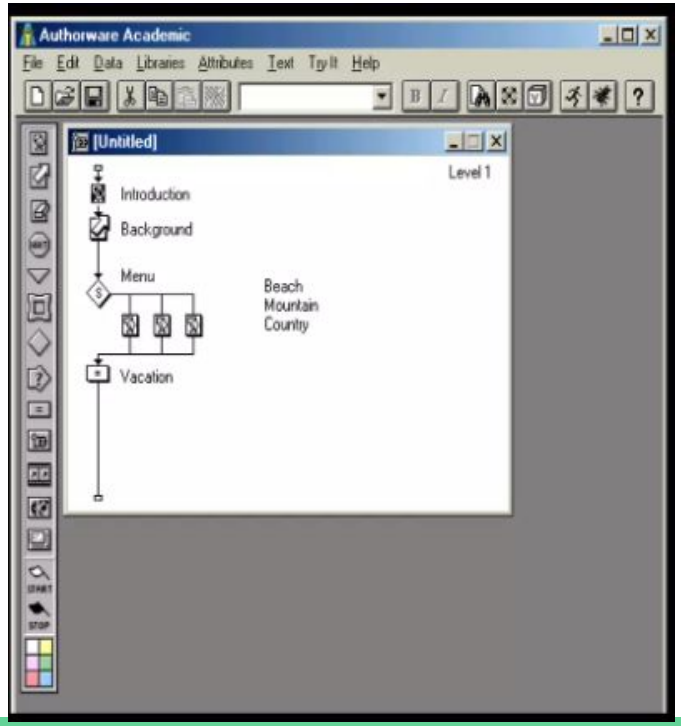
- Example: Authorware Professional (Windows/Mac) from Adobe, Icon Author (Windows)

Advantages:

- Clear structure
- Easy editing and updating

Disadvantages:

- Expensive



What You Need: Authoring Tools

3. Time Based Authoring Tools

- Time based authoring tools allow the designer to arrange various elements and events of the multimedia project along a well defined time line.
- Time-based tools are best to use when you have a message with a beginning and an end.
- As the time advances from starting point of the project, the events begin to occur, one after another.
- The events may include media files playback as well as transition from one portion of the project to another.
- Sequentially organized graphic frames are played back at a speed that you can set.
- Other elements (such as audio events) are triggered at a given time or location in the sequence of events.
- The more powerful time-based tools let you program jumps to any location in a sequence, thereby adding navigation and interactive control.
- These tools are best to use for those projects, wherein the information flow can be directed from beginning to end much like the movies.

What You Need: Authoring Tools

Examples: **Flash**: Flash is a time-based development environment. Flash, however, is also particularly focused on delivery of rich multimedia content to the Web.Flash delivers far more than simple static HTML pages. ActionScript, the proprietary, under-the-hood scripting language of Flash, is based upon the international ECMAScript standard

Adobe's Director: Adobe's Director is a powerful and complex multimedia authoring tool with a broad set of features to create multimedia presentations, animations, and interactive multimedia applications. It requires a significant learning curve, but once mastered, it is among the most powerful of multimedia development tools.

Advantages:

- Good for creating animation
- Branching, user-control and interactivity facility

Disadvantages:

- Expensive
- Steep learning curve to understand various features

Objects

- In multimedia authoring systems, multimedia elements and events are often treated as objects that live in a hierarchical order of parent and child relationships.
- Messages passed among these objects order them to do things according to the properties or modifiers assigned to them.
- Objects are particularly useful for games, which contain many components with many “personalities,” all for simulating real-life situations, events, and their constituent properties.
- Object-based authoring programs typically provide objects pre- programmed with sensible properties, messages, and functions.

Choosing an Authoring Tool

1. Editing Features

   The elements of multimedia—images, animations, text, digital audio and MIDI music, and video clips—need to be created, edited, and converted to standard file formats, using the specialized applications

   The more editors your authoring system has, the fewer specialized tools you may need. In many cases, however, the editors that may come with an authoring system will offer only a subset of the substantial features found in dedicated tools.

Choosing an Authoring Tool

2. Organizing Features

The organization, design, and production process for multimedia involves storyboarding and flowcharting.

Storyboards or navigation diagrams can also help organize a project and can help focus the overall project scope for all involved.

Because designing the interactivity and navigation flow of your project often requires a great deal of planning and programming effort, your storyboard should describe not just the graphics of each screen, but the interactive elements as well.

Many web-authoring programs such as Dreamweaver include tools that create helpful diagrams and links among the pages of a web site. Planning ahead in an organized fashion may prevent countless moments of indecision, keep the client from changing her mind without periodic sign-offs on the materials included, and, in the long run, save you money

Choosing an Authoring Tool

3. Programming Features

Multimedia authoring systems offer one or more of the following approaches, as explained in the following paragraphs:

- Visual programming with cues, icons, and objects
- Programming with a scripting language
- Programming with traditional languages, such as Basic or C
- Document development tools

- Visual programming with icons or objects is perhaps the simplest and easiest authoring process. If you want to play a sound or put a picture into your project, just drag the element's icon into the playlist—or drag it away to delete it.
- Authoring tools that offer a very high level language (VHLL) or interpreted scripting environment for navigation control and for enabling user inputs or goal-oriented programming languages—such as Flash, LiveCode, Director, and ToolBook—are more powerful by definition.
- The more commands and functions provided in the scripting language, the more powerful the authoring system.
- As with traditional programming tools, look for an authoring package with good debugging facilities, robust text editing, and online syntax reference. Other scripting augmentation facilities are advantageous, as well. In complex projects, you may need to program custom extensions of the scripting language for direct access to the computer's operating system.
- A powerful document reference and delivery system is a key component of some projects. Some authoring tools offer direct importing of preformatted text, indexing facilities, complex text search mechanisms, and hypertext linkage tools. These authoring systems are useful for development of CD-ROM information products, online documentation and help systems, and sophisticated multimedia-enhanced publications.

4. Interactivity Features

Interactivity empowers the end users of your project by letting them control the content and flow of information. Authoring tools should provide one or more levels of interactivity:

■ **Simple branching**, which offers the ability to go to another section of the multimedia production (via an activity such as a keypress, mouse click, or expiration of a timer)

■ **Conditional branching**, which supports a go-to based on the results of IF-THEN decisions or events

■ A structured language that supports complex programming logic, such as nested IF-THENs, subroutines, event tracking, and message passing among objects and elements

5. Performance Tuning Features

- Complex multimedia projects require exact synchronization of events— for example, the animation of an exploding balloon with its accompanying sound effect.
- Accomplishing synchronization is difficult because performance varies widely among the different computers used for multimedia development and delivery.
- Some authoring tools allow you to lock a production's playback speed to a specified computer platform, but others provide no ability whatsoever to control performance on various systems.
- In many cases, you will need to use the authoring tool's own scripting language or custom programming facility to specify timing and sequence on systems with different (faster or slower) processors. Be sure your authoring system allows precise timing of events.

6. Playback Features

Playback features are tools that allow you to test your multimedia project as you are creating it.

These tools let you quickly build a part of your project and then test it to see how it would look and work for the user.

You should spend a lot of time going back and forth between building and testing as you improve the content and timing of your project.

You may even want to share your project with others who can help you identify any weak points by using it extensively. It's like trying on a dress you're sewing to see how it fits before adding more details or making adjustments to the design.

7. Delivery Features

Delivering your project may require building a run-time version of the project using the multimedia authoring software.

A run-time version or standalone allows your project to play back without requiring the full authoring software and all its tools and editors.

Often, the run-time version does not allow users to access or change the content, structure, and programming of the project.

If you are going to distribute your project widely, you should distribute it in the run-time version. Make sure your authored project can be easily distributed.

8. Cross-Platform Features

It is also increasingly important to use tools that make transfer across platforms easy.

For many developers, the Macintosh remains the multimedia authoring platform of choice, but 80 percent of that developer's target market may be Windows platforms.

If you develop on a Macintosh, look for tools that provide a compatible authoring system for Windows or offer a run-time player for the other platform.

9. Internet Playability

Internet playability refers to the ability of multimedia projects to be delivered and played on the internet.

Since the internet has become a popular way of sharing multimedia content, authoring systems usually include tools to convert their output so that it can be delivered through HTML or DHTML using plugins or embedded code structures like Java or JavaScript.

It is important to test your authoring software before building your project to ensure that it will work properly on the internet.

You should test it on as many different platforms as possible to make sure it performs well and remains stable. It's like making sure a toy works properly before giving it as a gift to someone.